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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/329,558	06/10/1999	GRAHAM CHAPMAN	12463(CA998-	8251

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EXAMINER
TANG, KENNETH

ART UNIT	PAPER NUMBER
2195	

DATE MAILED: 06/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/329,558	CHAPMAN ET AL.
	Examiner	Art Unit
	Kenneth Tang	2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>30 March 2005</u>.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-5, 7-15 and 17-23</u> is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) <u>23</u> is/are allowed.

6) ☒ Claim(s) <u>1, 7-11, 17-22</u> is/are rejected.

7) ☒ Claim(s) <u>2-5 and 12-15</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>6/10/99</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a) ☐ All b) ☐ Some * c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the Amendment filed on 3/30/05. Applicant's arguments

have been fully considered but are not found to be persuasive.

2.   Claims 1-5, 7-15, and 17-23 are presented for examination.

Claim Rejections - 35 USC § 102

        The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   **Claims 1, 7, 9-11, 17, and 19-22 are rejected under 35 U.S.C. 102(e) as being**

anticipated by Hall (US 5,828,883).

4.   As to claims 1, Hall teaches a method for mapping a valid stack up to a destination

program counter, said stack having a layout of instructions for a method including one or more

branches (hierarchy) *(col. 7, lines 13-23)*, said method comprising:

        mapping a path of control flow on the stack from any start point in a selected method to

the destination program counter by locating a linear path (selecting a focus call path) from the

beginning of the method to the destination program counter and iteratively processing (iteratively

repeated) an existing bytecode sequence for each branch, and identifying said path as complete

when said destination program counter is reached (desired efficiency is reached or no further

improvements in efficiency can be achieved) *(col. 3, lines 35-59, col. 4, lines 7-10)*; and

simulating stack actions for executing bytecodes along said path, and constructing a

virtual stack (dual stack) for storage in a pre-allocated memory location *(col. 3, lines 54-59)*.

5.   As to claims 7, Hall teaches encoding the virtual stack as a bitstring and storing the

bitstring at a selected destination for use in memory management operations *(col. 3, lines 54-59)*.

6.   As to claims 9, Hall teaches storing the bitstring to a pre-allocated area on the stack *(col. 3, lines 54-59)*.

7.   As to claim 10, Hall teaches wherein the step of simulating stack actions executing the

bytecodes along the path further comprises: inserting pre-determined stack actions for bytecodes

maintaining the control flow in the selected method; and calculating (computing) stack actions

for bytecodes transferring the control flow from the selected method *(col. 3, lines 40-67, col. 7, lines 62-67)*.

8.   As to claims 11, it is rejected for the same reasons as stated in the rejection of claim 1.

9.   As to claims 17-20, they are rejected for the same reasons as stated in the rejection of

claims 7-10.

10.   As to claims 21, it is rejected for the same reasons as stated in the rejection of claim 1.

11.   As to claims 22, it is rejected for the same reasons as stated in the rejection of claim 11.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

12.   **Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall**

(US 5,828,883) in view of Poff et al. (hereinafter Poff) (US 6,330,659).

13.   As to claims 8, Hall fails to explicitly teach storing the bitstring on a heap. However,

Poff teaches a Java Virtual Machine as including bytecode instructions to store on a garbage-

collected heap as well as a stack *(col. 2, lines 25-32)*. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to combine the feature of storing on a

heap to the Hall's system because this would allow for garbage collection and to utilize a

memory location from which newly created instances are allocated *(col. 2, lines 37-42)*.

14.   As to claim 18, it is rejected for the same reasons as stated in the rejection of claim 8.

Allowable Subject Matter

15.   Claims 2-5 and 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16.   Claim 23 is allowed.

Response to Arguments

17.   During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

18.   Applicant argues on page 12 that Hall uses call stacks while the Applicant's invention uses operand stacks.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "operand stacks") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The broadest reasonable interpretation of a stack includes operand stacks and call stacks.

19.   *Applicant argues on page 12 of the Remarks that Hall does not mention of the word "branch".*

In response, just because the exact word is not in the reference of Hall, it doesn't mean that the concept is not taught. The broadest reasonable interpretation of branches is taught in Hall by the hierarchy *(col. 7, lines 13-23 and Fig. 1B)*. A branch instruction is an assembly or machine level instruction that transfers control to another instruction. In Fig. 1B of Hall, a branch connects "MAIN [609]" to a plurality of target procedures, "LOAN-APP [105]", as one example. Each path to a target procedure is a branch. Hall also teaches creating a virtual stack based on a path taken. Therefore, Hall teaches creating a virtual stack based on a branch as detailed by the claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth Tang whose telephone number is (571) 272-3772. The examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kt
5/31/05

LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER